DISTRICT 11

MATERIALS INFORMATION BROCHURE

MATERIALS ENGINEERING BRANCH

11-SD-905
KP R17.6/R18.8
PM R10.9/R11.7
11-091801

CT

CALIFORNIA DEPARTMENT OF TRANSPORTATION

State of California

Memorandum

Business, Transportation and Housing Agency

To : LEON EDMONDS
Office Engineer
District 11

Date: June 7, 2002

File: 11-SD-905
KP R17.6/R18.8
EA 091801

From : **DEPARTMENT OF TRANSPORTATION - DISTRICT 11**
Materials Engineering Branch

Subject:: Materials Information Brochure

Attached herewith for your consideration

MATERIALS INFORMATION

FOR PROPOSED PROJECT ON ROUTE 905

IN SAN DIEGO COUNTY

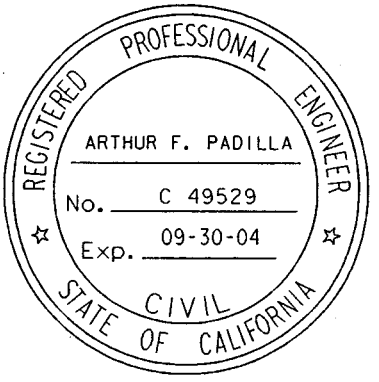
STATE ROUTE 905

For Construction of a portion of Route 905 in San Diego County from Airway Road to the Otay Mesa International Border Crossing

Arthur F. Padilla
District Materials Engineer

Attachment

AFP: ra



cc: RMorrison (9)
WLopez (35)
CDavis (35)
LEdmonds (37)
JEgan (63)
LKemp (73)
Project File (mib 091801.doc)

MATERIALS INFORMATION

Not a Part of the Contract

11-SD-905
KP R17.6/R18.8
EA 091801

NOTE: Information contained herein has been compiled in accordance with Section 2-1.03 of the Standard Specifications. Additional information is available for review at the District 11, Materials Laboratory, 7177 Opportunity Road, San Diego, California.

TABLE OF CONTENTS

INDEX OF SHEETS

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905, 805	VARIOUS	1	

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON

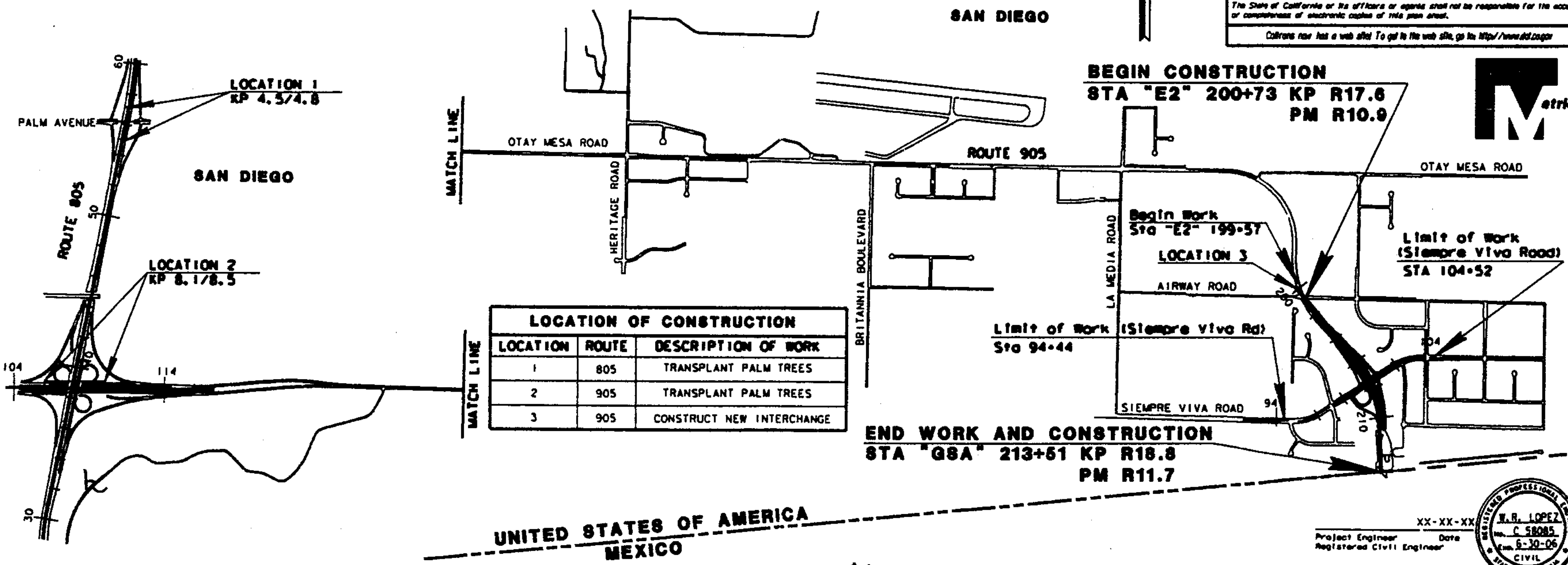
STATE HIGHWAY

IN SAN DIEGO COUNTY IN SAN DIEGO ON ROUTE 905 FROM 0.2 km WEST TO 0.2 km EAST OF ROUTE 805/905 SEPARATION AND FROM AIRWAY ROAD TO OTAY MESA BORDER CROSSING AND ON ROUTE 805 AT PALM AVENUE OVERCROSSING

To be supplemented by Standard Plans dated JULY 1999

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov



LOCATION OF CONSTRUCTION		
LOCATION	ROUTE	DESCRIPTION OF WORK
1	805	TRANSPLANT PALM TREES
2	905	TRANSPLANT PALM TREES
3	905	CONSTRUCT NEW INTERCHANGE

NO SCALE

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

XX-XX-XX
Project Engineer Date
Registered Civil Engineer

W.R. LOPEZ No. C 58085 Exp. 6-30-06 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

Plans Approval Date

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
W.R. LOPEZ	XX-XX	R. SANCHEZ	XX-XX

Contract No. 11-091804

CU 11224 | EA 091801

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbapadilla
DGN FILE => ...\b091804001.dgn

LAST REVISION 05-28-02 | DATE PLOTTED => 03 JUN 2002 | TIME PLOTTED => 14:23:03

FORM DC-OE-93-PF (REV.06/00) ... AC TITLE

MATERIALS INFORMATION

R-VALUES

R-values of the existing soils within the general limits of the project were found to vary from less than 5 to 26. See **Appendix A** for further detail.

Boring No.	Location - "G" Line	Depth – Meter	R-Value
2	208+77 63.9 m Rt.	0.3 – 1.0	17
4	207+31 30.9 m Lt.	0.0 – 0.9	26
5	206+50 61.6 m Rt.	0.0 – 0.9	<5
6	202+71 17.1 m Lt.	0.0 – 0.9	16

Our recommended structural section designs are based on a minimum design R-value of 10. Traffic Indices were provided by District Traffic Analysis department.

CORROSION ANALYSIS

Corrosion potential tests were performed on six near-surface soil samples and one water sample taken from a drain ditch. Based on this testing, the environment is rated as generally corrosive to metal and reinforced concrete.

The design values chosen for input into Caltran's "CULVERT4.EXE" computer program to determine the theoretical 50-year design life recommendations are as follows:

- PH = 8.8
- Minimum Resistivity = 333 Ohms.cm
- Sulfates = 1500 mg/kg
- Chlorides = 780 mg/kg
- Non-abrasive flow conditions

RECOMMENDED CULVERT ALTERNATIVES

1. Plastic Pipe Culverts, either Polyethylene Pipe (Type S), Ribbed Profile Wall Polyethylene Pipe, or Ribbed Profile Wall Polyvinyl Chloride Pipe that meet Caltran's current diameter and fill height requirements.

2. Type II Modified or Type V cement, 251.25 kg/m^3 cement, 83.75 kg/m^3 mineral admixture replacement (normally fly-ash), a maximum water-to-cementitious material ratio of 0.45, and a 64 mm minimum cover over all reinforcing steel.

GROUND WATER

Perched ground water was not encountered in any of the test pit excavations to the depth of 1.5 m (5 ft). For actual groundwater depths throughout this project, refer to the Geotechnical Report issued by Geotechnical Roadway South. This project should have no significant impact on existing groundwater conditions.

GRADING FACTORS

The average relative compaction of the existing soils within the upper 0.9 m (3 ft) is about 84 percent. Since these soils are relatively soft, it is anticipated that about 60 mm of settlement will occur due to compression of the existing soils during subgrade preparation, prior to placement of embankment soils. Based on the mitigation measures recommended in the Materials Design Report dated November 7, 2001, we would anticipate a grading factor of 0.93 (7% shrinkage) for subgrade removal and recompaction.

EARTHWORK QUANTITIES

The following earthwork quantities are from the June 12, 2002 Engineer's Estimate.

Roadway Excavation	90,200 m^3
Imported Borrow	39,200 m^3
Embankment	123,000 m^3
Class 2 Aggregate Base	29,800 m^3
Class 4 Aggregate Subbase	15,400 m^3

MATERIAL RECOMMENDATIONS

The following is a recommendation for imported borrow material to be placed above the existing ground and within the roadbed:

R-Value	10

Aggregate subbase shall be Class 4 and shall conform to the provisions in Section 25, "Aggregate Subbase," of the Standard Specifications, Standard Special Provision 25-020 (dated 07/30/99) and these special provisions.

Material for aggregate subbase may be processed from soils within the project or obtained from commercial sources.

Class 4 aggregate subbase shall have a minimum R-value of 40 and a minimum Sand Equivalent of 22.

The Class 4 aggregate subbase shall conform to the following grading:

Sieve Sizes	Percentage Passing
100 mm	100
4.75 mm	30-100
600 μm	0-65
75 μm	0-20

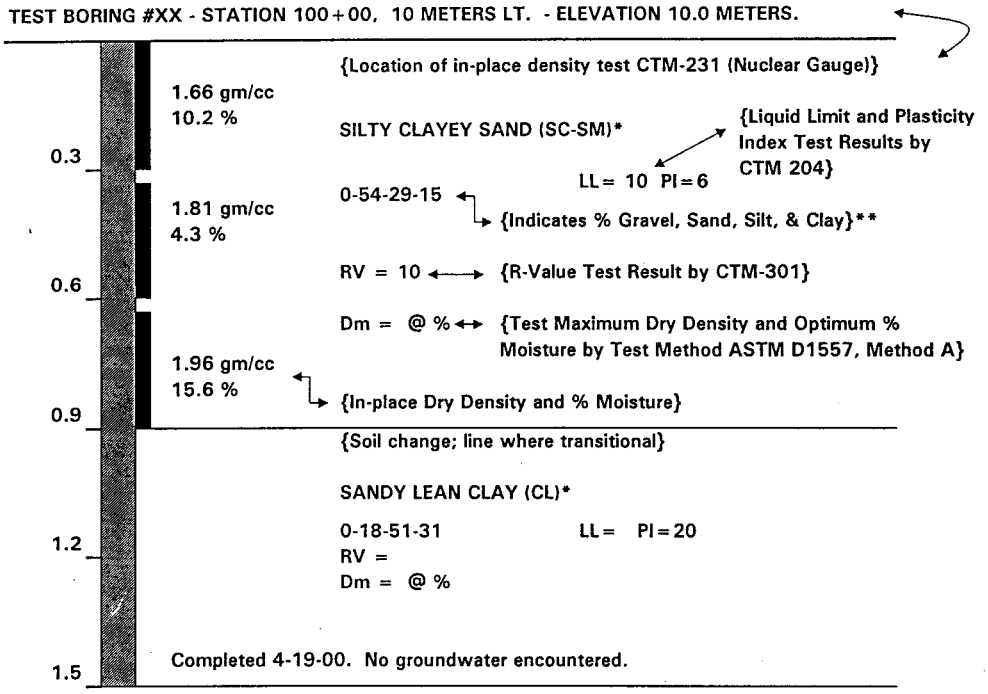
MATERIALS SOURCES

A current list (dated April 5, 2002) of mining operations eligible to sell materials such as aggregates to the State of California in San Diego County follows:

Calif. Mine ID	Mine Name	Operated By
91-37-0002	NORTH TWIN OAKS VALLEY QUARRY	HANSON AGGREGATE CO.
91-37-0004	MISSION VALLEY ROCK PLANT	H.G. FENTON CO.
91-37-0005	PALA ROCK PLANT (SAND)	HANSON AGGREGATE CO.
91-37-0007	CARROLL CANYON PLANT	HANSON AGGREGATE CO.
91-37-0009	WYROC SYCAMORE QUARRY	WYROC, INC.
91-37-0010	LAKESIDE SAND PIT	C.W. MCGRATH, INC.
91-37-0011	HILLSDALE PIT	C.W. MCGRATH, INC.
91-37-0012	EL CORZAN	CITY OF OCEANSIDE
91-37-0013	SIM J. HARRIS COMPANY	HANSON AGGREGATE CO.
91-37-0015	UCLH SAN MARCOS	HANSON AGGREGATE CO.
91-37-0016	OCEANSIDE/CARLSBAD	HANSON AGGREGATE CO.
91-37-0019	TTT QUARRY	SUPERIOR READY MIX CONCRETE
91-37-0020	HESTER'S GRANITE	HANSON AGG
91-37-0021	SLAUGHTER HOUSE CANYON	PIONEER CONCRETE OF CA., INC.
91-37-0022	MCGRATH BORROW PIT	C.W. MCGRATH, INC.
91-37-0024	MISSION GORGE PIT	SUPERIOR READY MIX CONCRETE, L
91-37-0025	RCP PITS 1,2,3, & 5 INCLUSIVE	RCP BLOCK & BRICK, INC.
91-37-0026	MISSION VALLEY	CALMAT CO
91-37-0027	SLOAN CANYON	SLOAN CANYON SAND COMPNAY
91-37-0028	MISSION VALLEY-EX FENTON	CALMAT CO
91-37-0029	CARROLL CANYON	CALMAT CO
91-37-0030	VULCAN – POWAY	VULCAN MATERIALS
91-37-0033	LAKESIDE	VULCAN MATERIALS
91-37-0034	EL MONTE PIT	HANSON AGGREGATE CO.
91-37-0035	OTAY RANCH PIT	HANSON AGGREGATE CO.
91-37-0037	BORDER HIGHLANDS PIT	JIM & LOIS NELSON LP
91-37-0042	MONTE VISTA BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0043	ALLEN BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0044	BUCKMAN SPRINGS BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0045	OLIVE STREET BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0046	MCCAIN BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0047	BURNAND BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0048	WARNER BORROW PIT	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0050	MORETTI-MESA GRANDE B.P.	SAN DIEGO COUNTY PUBLIC WORKS
91-37-0052	NATIONAL QUARRIES	NATIONAL QUARRIES
91-37-0053	JAMUL QUARRY	CALMAT CO.
91-37-0054	INLAND VALLEY MATERIALS	INLAND VALLEY MATERIALS
91-37-0056	PALO VERDE LAKE DESILTATION &	PALO VERDE RANCH HOA
91-37-0057	THE PAUMA VALLEY COUNTRY CLUB	THE PAUMA VALLEY COUNTRY CLUB
91-37-0060	RANCHO SAN DIEGO GOLF COURSE	J. CLOUD INC.
91-37-0063	WOODWARD SAND	LAKESIDE LAND COMPANY, INC.
91-37-0064	BAXTER QUARRY	M.J. BAXTER DRILLING COMPANY

APPENDIX A

TEST BORING LEGEND

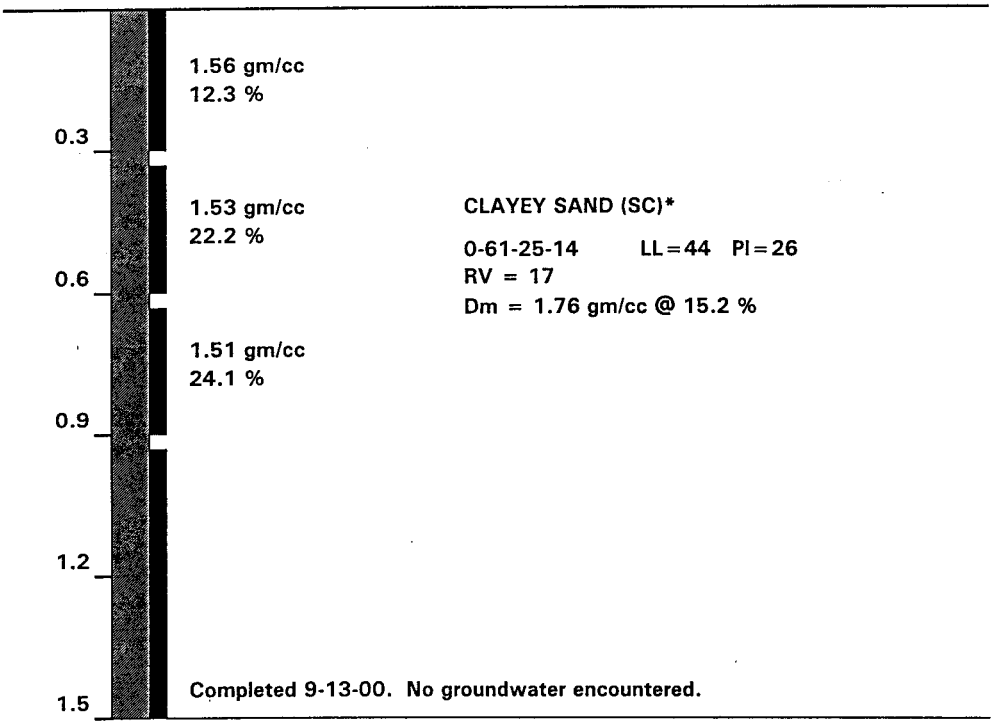


* Estimated unified Soil Classification

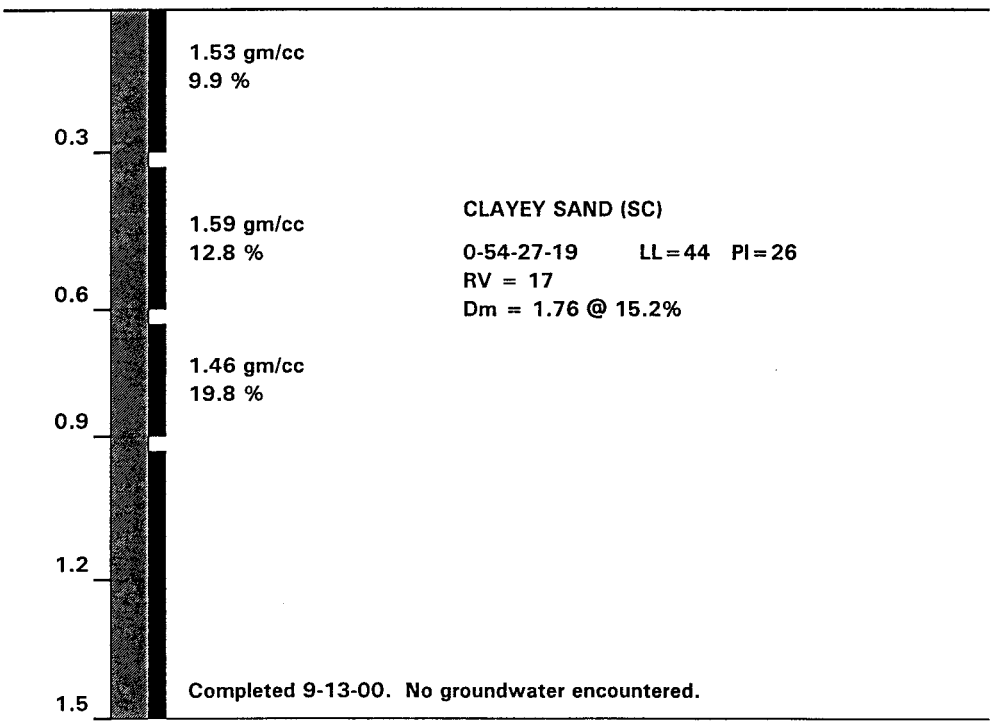
** Gravel: 76.2 mm to 4.75 mm
Sand: 4.75 mm to 75 microns
Silt: 75 to 5 microns
Clay: less than 5 microns

Test Methods CTM 202 &203

TEST BORING #1 - STATION 208+12, 116.2 METERS RT. - ELEVATION 162.1 METERS.

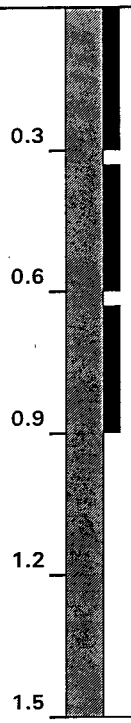


TEST BORING #2 - STATION 208+77, 63.9 METERS RT. - ELEVATION 161.9 METERS.



* Estimated Unified Soil Classification

TEST BORING #3 - STATION 207+96, 38.3 METERS LT. - ELEVATION 164.0 METERS.



1.54 gm/cc
24.2 %

1.30 gm/cc
39.5 %

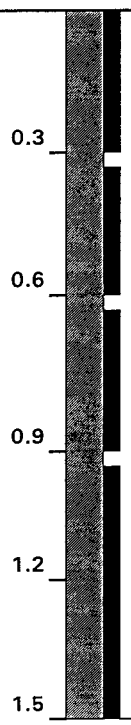
1.49 gm/cc
30.6 %

CLAYEY SAND (SC)*

0-58-34-8 LL=44 PI=26
RV = 17
Dm = 1.76 gm/cc @ 15.2 %

Completed 9-13-00. No groundwater encountered.

TEST BORING #4 - STATION 207+31, 30.9 METERS LT. - ELEVATION 165.2 METERS.



1.29 gm/cc
37.7 %

1.28 gm/cc
39.6 %

1.34 gm/cc
34.7 %

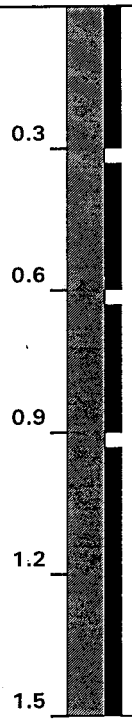
SANDY ELASTIC SILT (MH)

0-36-54-10 LL=59 PI=22
RV = 26
Dm = 1.43 @ 20.0%

Completed 9-14-00. No groundwater encountered.

* Estimated Unified Soil Classification

TEST BORING #5 - STATION 206+50, 61.6 METERS RT. - ELEVATION 165.6 METERS.



1.43 gm/cc
12.3 %

0.3

1.32 gm/cc
21.4 %

SANDY FAT CLAY (CH)

0-32-27-41 LL=55 PI=35
RV = <5
Dm = 1.75 @ 17.2%

0.6

1.36 gm/cc
25.1 %

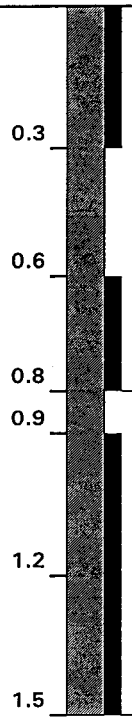
0.9

1.2

1.5

Completed 9-14-00. No groundwater encountered.

TEST BORING #6 - STATION 202+71, 17.1 METERS LT. - ELEVATION 167.8 METERS.



1.58 gm/cc
20.3 %

0.3

SANDY LEAN CLAY (CL)

0-41-27-32 LL=48 PI=29
RV = 16
Dm = 1.69 gm/cc @ 19.4 %

0.6

1.59 gm/cc
30.3 %

0.8

0.9

SILTY SAND (SM)

0-72-20-8 LL=NP PI=NP
RV = n/a
Dm = 1.56 gm/cc @ 20.2 %

1.53 gm/cc
29.8 %

1.2

1.5

Completed 9-14-00. No groundwater encountered.